**THIS OPINION WAS NOT WRITTEN FOR PUBLICATION**

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 34

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* VINCENT SAUVINET, JEAN BLETRY, MICHELINE BONNAUD and MAURICE TROUVE

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Appeal No. 93-2172
Application 07/363,758[1]

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HEARD: June 11, 1997

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Before JOHN D. SMITH, PAK and WALTZ[2], *Administrative Patent Judges.*

JOHN D. SMITH, *Administrative Patent Judge*.

**DECISION ON APPEAL**

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[1] Application for patent filed July 10, 1989. According to appellants, this application is a continuation-in-part of Application 06/821,365 filed January 22, 1986, now U.S. Patent No. 4,859,499 granted August 22, 1989.

[2] Administrative Patent Judge Waltz has been substituted for Administrative Patent Judge Thierstein who participated in the hearing but retired prior to the rendering of this decision.

This is an appeal pursuant to 35 U.S.C. § 134 from the final rejection of claims 37[3] and 43-66.

Claims 37, 43, 46, 47 and 59 are representative and are reproduced below:

37. A plate of glass coated with a layer containing indium and tin oxides having zones of a low emissivity and resistivity of less than or equal to 0.15 and 3 x $10^{-4}$ ohm-cm, respectively for a thickness of between about 1800 and 4500 angstroms with at least one other zone wherein the emissivity and resistivity are higher than 0.15 and 3 x $10^{-4}$ ohm-cm, respectively that is produced by:

preparing a dry metal composition containing indium formate;

mixing at least a powdered or gaseous tin compound or a gaseous organotin compound with the indium formate in proportions ranging from one to thirty weight percent;

depositing said composition onto a surface of a heated substrate with coating means so as to pyrolyze the composition; and

heating the coated substrate to enhance the properties of the layer.

43. A plate of glass coated with a pyrolyzed metal oxide layer comprising indium oxide formed by depositing a predetermined amount of an organic indium compound on a heated substrate, thereby pyrolyzing the indium compound.

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[3] The examiner's final rejection inadvertently failed to treat claim 37, which claim was specifically rejected in the Answer and denoted as a new rejection. Appellants' Reply Brief and concurrently filed amendment were denied entry by the examiner.

46. The glass plate of claim 45, wherein the thickness of the layer is between about 1800 to 4500 Angstroms.

47. The glass plate of claim 46, wherein the electrical properties of the layer comprise an emissivity of less than or equal to 0.15 and a resistivity of $3 \times 10^{-4}$ ohm-cm or less.

59. A plate of glass coated with a pyrolyzed metal oxide layer comprising indium and tin oxides formed by depositing a predetermined amount of a mixture of an organic indium compound and a tin compound on a heated substrate, thereby pyrolyzing the mixture.

The sole reference relied upon by the examiner is:

King et al. (King) 4,006,070 Feb. 1, 1977

The appealed claims stand rejected for obviousness (35 U.S.C. § 103) over King.

We reverse the rejection as to claims 37 and 51. We affirm the rejection as to claims 43-50 and 52-66.

The subject matter on appeal is broadly directed to a glass plate coated with a layer of indium oxide or indium and tin oxides formed by pyrolyzing organic indium and/or tin compounds on a heated glass substrate. Layers formed by the pyrolyzing process have a low emissivity and good electrical conductivity. As set forth in dependent claim 47 on appeal, the electrical

properties of the layer are defined as having an emissivity[4] of less than or equal to 0.15 and a resistivity of $3 \times 10^{-4}$ ohm-cm or less.

Based on product-by-process principles set forth in *In re Brown*, 459 F.2d 531, 173 USPQ 685 (CCPA 1972) and *In re Fessmann*, 489 F.2d 742, 180 USPQ 324 (CCPA 1974), the examiner has rejected each of the appealed claims for obviousness (35 U.S.C. § 103) over King, a prior art reference, which describes a glass plate coated with a metal oxide layer of indium and tin by a sputtering technique, *vis á vis* a pyrolysis technique, as set forth in the appealed claims. Appellants contend that the claimed recitation of a "pyrolized" layer defines a structural bond between the

[4] Emissivity is defined as the ratio of the radiation intensity of a nonblackbody to the radiation intensity of a blackbody. This ratio is always less than or just equal to one. The emissivity characterizes the radiation or absorption quality of nonblack bodies. Emissivities vary with temperature and also vary throughout the spectrum. See the *McGraw-Hill Encyclopedia of Science & Technology*, 7th Edition, copyright 1992, vol. 6, p. 339, copy attached. It is important that oxide coatings of tin or indium on glass panes used in automobiles have a low emissivity because in winter, loss of heat from the passenger compartment of the vehicle is reduced, and in summer the addition of heat from the exterior is also reduced. When these coatings are to be supplied with electricity to act as heating layers they typically have emissivities less than or equal to 0.15. See U.S. Patent No. 4,584,236 to Colmon patented April 22, 1986 at column 1, lines 52-58; column 2, lines 33-43; and column 3, lines 17-21. A copy of this patent is also attached.

layer and plate of glass and distinguishes the subject matter defined by the claims from the sputter coated glass plates described in King. In support of their argument, appellants rely on a rule 132 declaration from co-inventor Sauvinet in which it is stated that a pyrolyzed coating "is substantially more strongly bonded to a substrate than a sputtered coating." See the declaration at paragraph 7. Sauvinet further states that the greater strength of a pyrolyzed coating compared to a sputtered coating has been confirmed by many tests in the field of substrate coating. Sauvinet, however, fails to provide any specific data regarding the alleged more strongly bonded pyrolyzed coatings. Moreover, no bonding data is reported in the Sauvinet declaration for an indium and tin oxide glass coated substrate sputter coated under the controlled and relatively high temperatures[5] utilized by King. See King at column 3, lines 38-40 and column 5, lines 7-9. Accordingly, we agree with the examiner that appellants have failed to provide objective factual evidence that the product produced by King is structurally different from the product claimed on appeal.

[5] Sauvinet opines that it is the "higher temperature of pyrolysis as compared to sputtering" which produces the greater bonding strength. See paragraph 7 of the declaration.

When the prior art discloses a product which reasonably appears to be either identical or only slightly different than a product defined by a product-by-process claim, the burden is on applicant to present objective evidence from which the examiner may reasonably conclude that the claimed product differs structurally from the prior art product. In this case, appellants have failed to meet their evidentiary burden.

Certain appealed claims such as dependent claim 47 and dependent claim 64 define the coated glass plate by reference to electrical and optical properties. Specifically, the claimed oxide coating is said to have a resistivity of $3 \times 10^{-4}$ ohm-cm or less in combination with an emissivity of less than or equal to 0.15. The King reference clearly describes the transparent electrically conductive films formed by sputtering as having an electrical resistivity of $3 \times 10^{-4}$ ohm-cm or less. See Examples 2 and 4-6 and column 11, lines 18 and 19. Because the sputter coated indium/tin oxide coating of King is produced by a method similar to that utilized by appellants, utilizing a high controlled temperature in an oxygen containing atmosphere to produce a coating which is substantially colorless (column 11, lines 19-21), there is a reasonable basis to presume that the emissivity of King's indium/tin oxide coating is identical to

that claimed. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977). Moreover, as observed by the examiner, appellants themselves have stated that "a high resistivity will correspond to a high emissivity". See appellants' amendment filed November 4, 1991 at page 5. Accordingly, a low resistivity should correspond to a low emissivity. In the Brief at pages 11 and 12, appellants imply that their statement made in the previous amendment was factually incorrect. Appellants now contend that it is known that different thicknesses of metal oxide layers will exhibit different colors in reflection and therefore these different layers have different emissivities. Thus, appellants now contend that different thicknesses of metal oxide layers do not necessarily have different resistivities. Appellants have not explained, however, how this argument applies to the colorless films formed by the King process.

We also observe, as pointed out by the examiner, that King's metal oxide coated glass is intended to be used as a wind screen wherein the film provides electrical resistance heating for deicing or demisting. See the King reference at column 1, lines 9-16. In this regard, the examiner has stated that low emissivities are known to be desirable when the coatings are used as heating layers on wind screens. This factual assertion by the

examiner has not been challenged by appellants. Thus, we also agree with the examiner that it would have been obvious to one of ordinary skill in the art to provide the coatings of King with low emissivity. See the Answer at page 4. Also see footnote 4.

Appealed claims 37 and 51 stand on a different basis. These claims define a plate of glass coated with an oxide layer having zones of low emissivity and low resistivity and another zone having a higher emissivity and resistivity. The examiner contends that King discloses various zones within the coating having different electrical properties and refers to the reference generally at column 6. However, we find no specific disclosure in this section of King which indicates that separate zones should be formed wherein the emissivity and resistivity are less than or equal to 0.15 and $3 \times 10^{-4}$ ohm-cm in a first zone and wherein the emissivity and resistivity are higher than 0.15 and $3 \times 10^{-4}$ ohm-cm in a second zone as required by these claims. Thus, we find that the disclosures of King alone are insufficient to establish a *prima facie* case of obviousness for the subject matter defined by appealed claims 37 and 51.

In light of the foregoing, we affirm the examiner's rejection of appealed claims 43-50 and 52-66. We reverse the

examiner's rejection as to claims 37 and 51. Therefore, the decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

**AFFIRMED-IN-PART**

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| JOHN D. SMITH<br>Administrative Patent Judge | ) | |
| CHUNG K. PAK<br>Administrative Patent Judge | ) | BOARD OF PATENT APPEALS AND INTERFERENCES |
| THOMAS A. WALTZ<br>Administrative Patent Judge | ) | |

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